

Tools and Environment

Software 1 and Software 2 – Python Labs for Math and Physics

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The Environment

Python, Anaconda, JupyterLab and Notebooks

Individual Edition is now

ANACONDA DISTRIBUTION

The world's most popular open-source Python distribution platform

Anaconda Distribution

Download 

For Windows

Python 3.9 • 64-Bit Graphical Installer • 594 MB

Get Additional Installers



Open Source

Access the open-source software you need for projects in any field, from data visualization to robotics.



User-friendly

With our intuitive platform, you can easily search and install packages and create, load, and switch between environments.



Trusted

Our securely hosted packages and artifacts are methodically tested and regularly updated.

<https://www.anaconda.com/products/individual>

Features



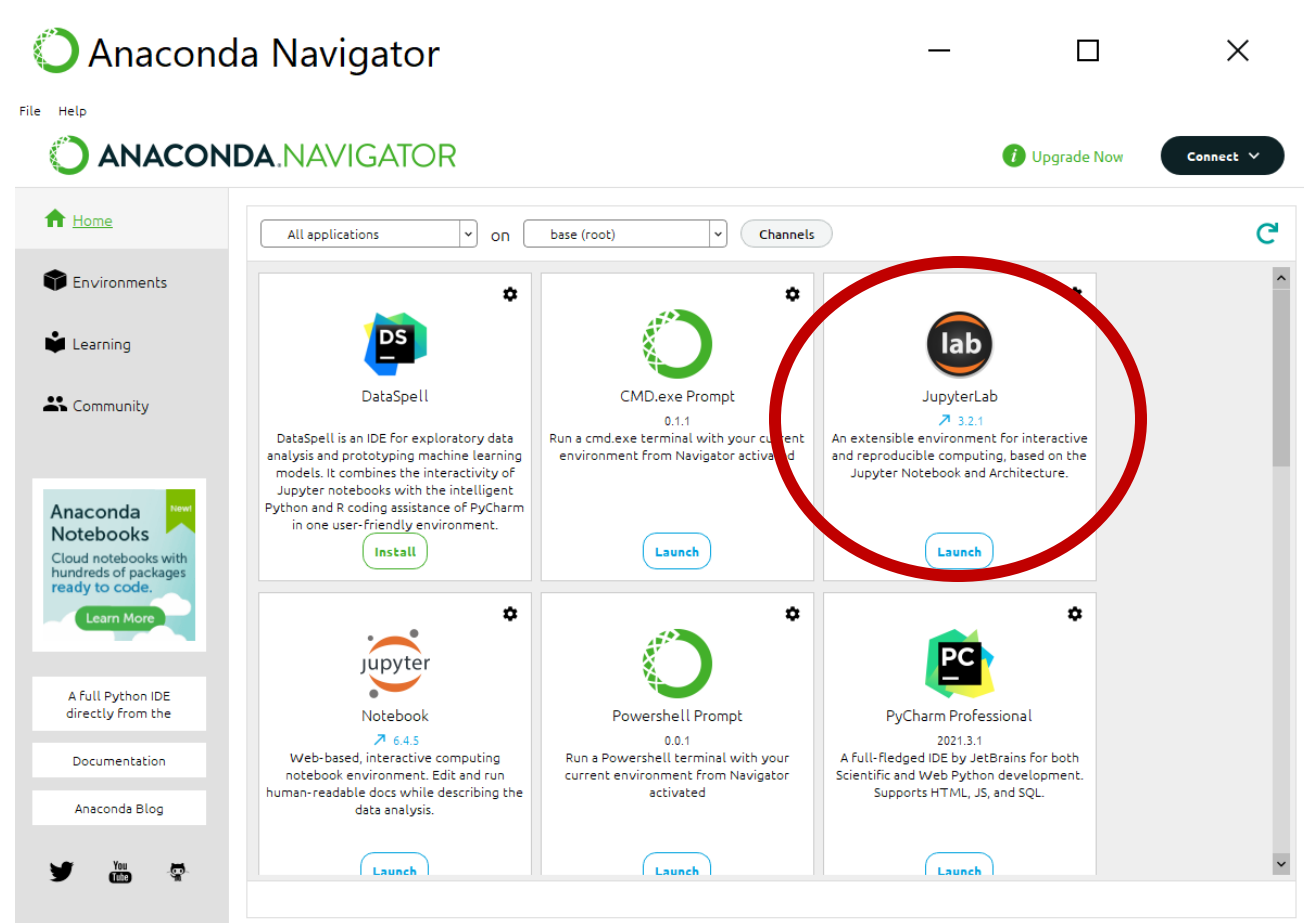
Anaconda Repository

Our repository features over 8,000 open-source data science and machine learning packages, Anaconda-built and compiled for all major operating systems and architectures.

<https://www.anaconda.com/products/individual>

Anaconda Navigator

1. Install
Anaconda
Distribution
2. Open
Anaconda
Navigator
3. Launch
JupyterLab

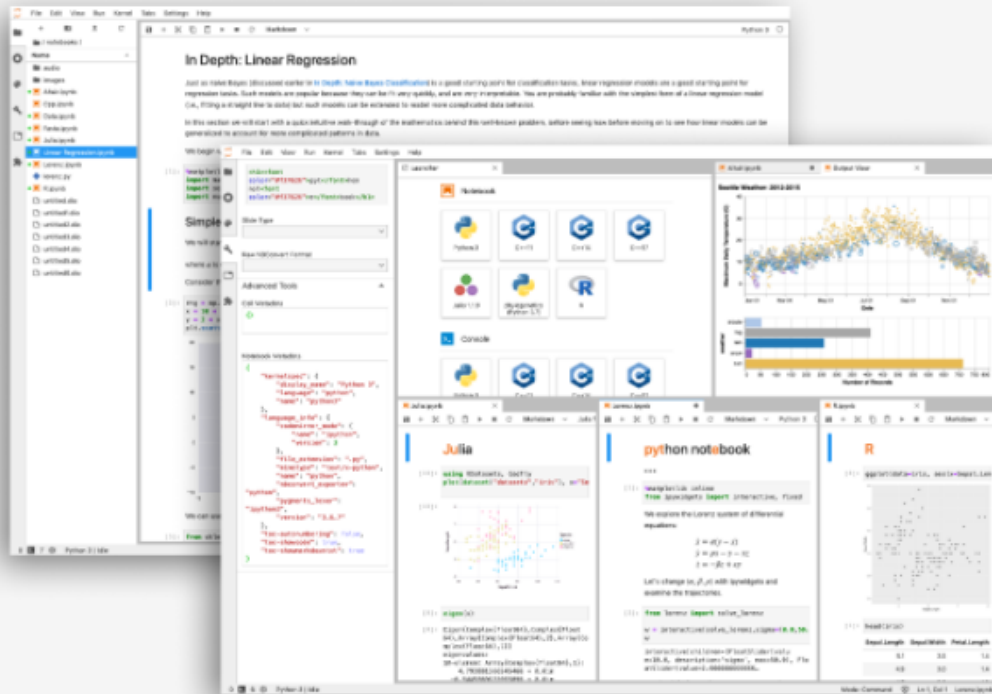


[Anaconda Distribution > Download](#)

Jupyter Notebook

with Anaconda Distribution on own computer

JupyterLab



JupyterLab: Jupyter's Next-Generation Notebook Interface

JupyterLab is a web-based interactive development environment for Jupyter notebooks, code, and data. JupyterLab is flexible: configure and arrange the user interface to support a wide range of workflows in data science, scientific computing, and machine learning. JupyterLab is extensible and modular: write plugins that add new components and integrate with existing ones.

Try it in your browser

Install JupyterLab

<https://jupyter.org/>

JupyterLab Interface

Files and
folders

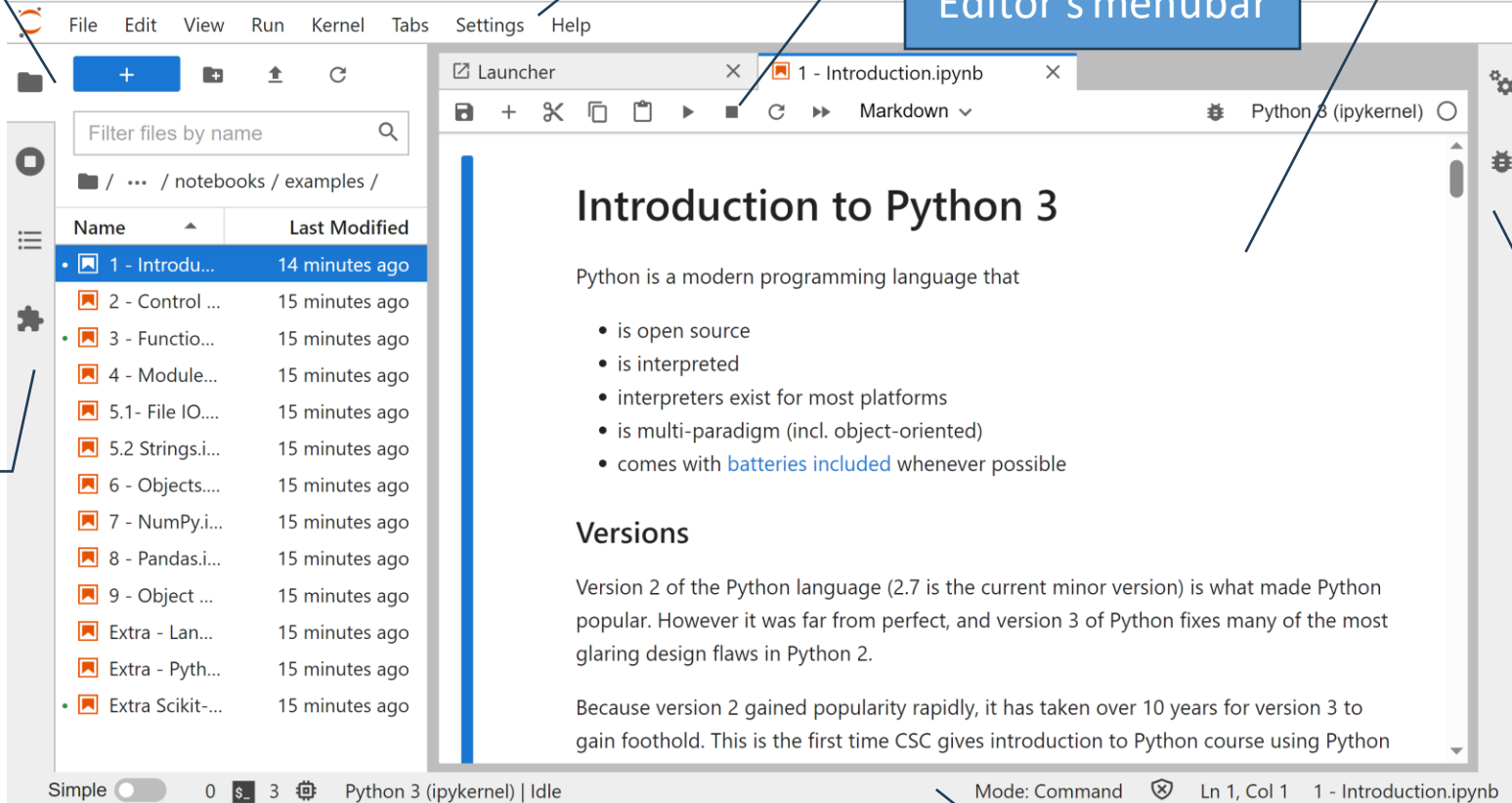
Main menubar

Editor/Main area

Editor's menubar

Right sidebar

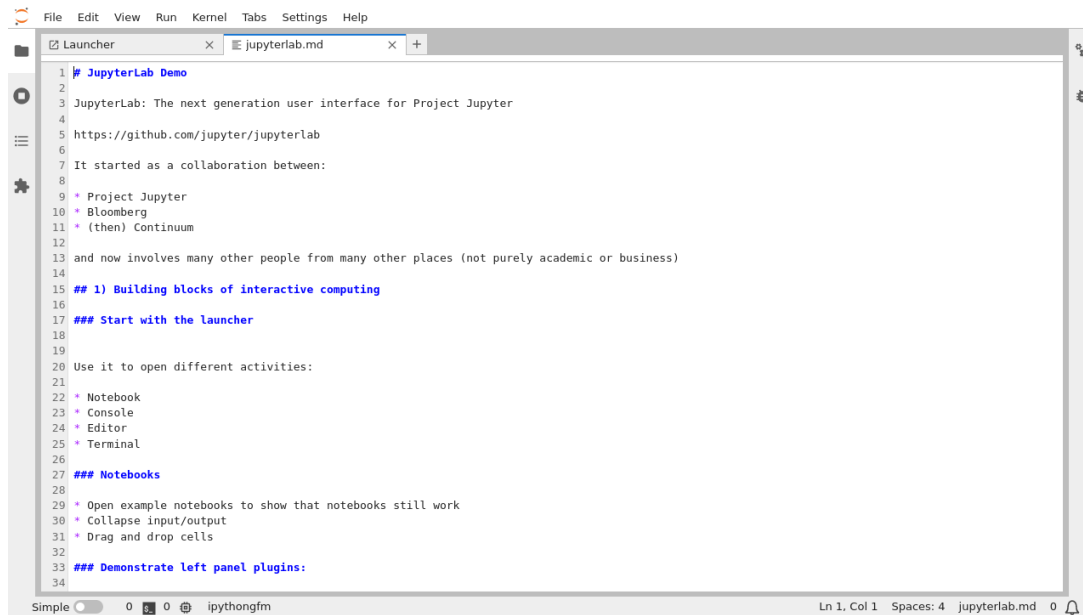
Tabs



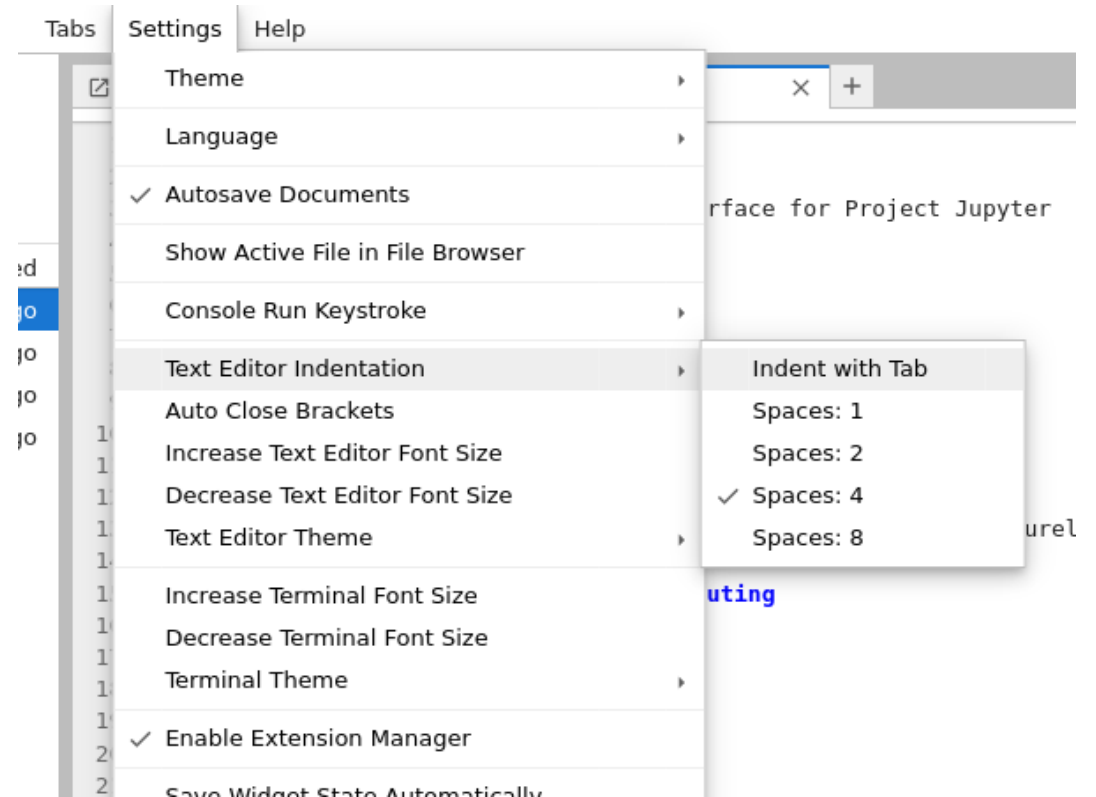
Status bar

[The JupyterLab Interface — JupyterLab 3.4.5 documentation](#)

Editor



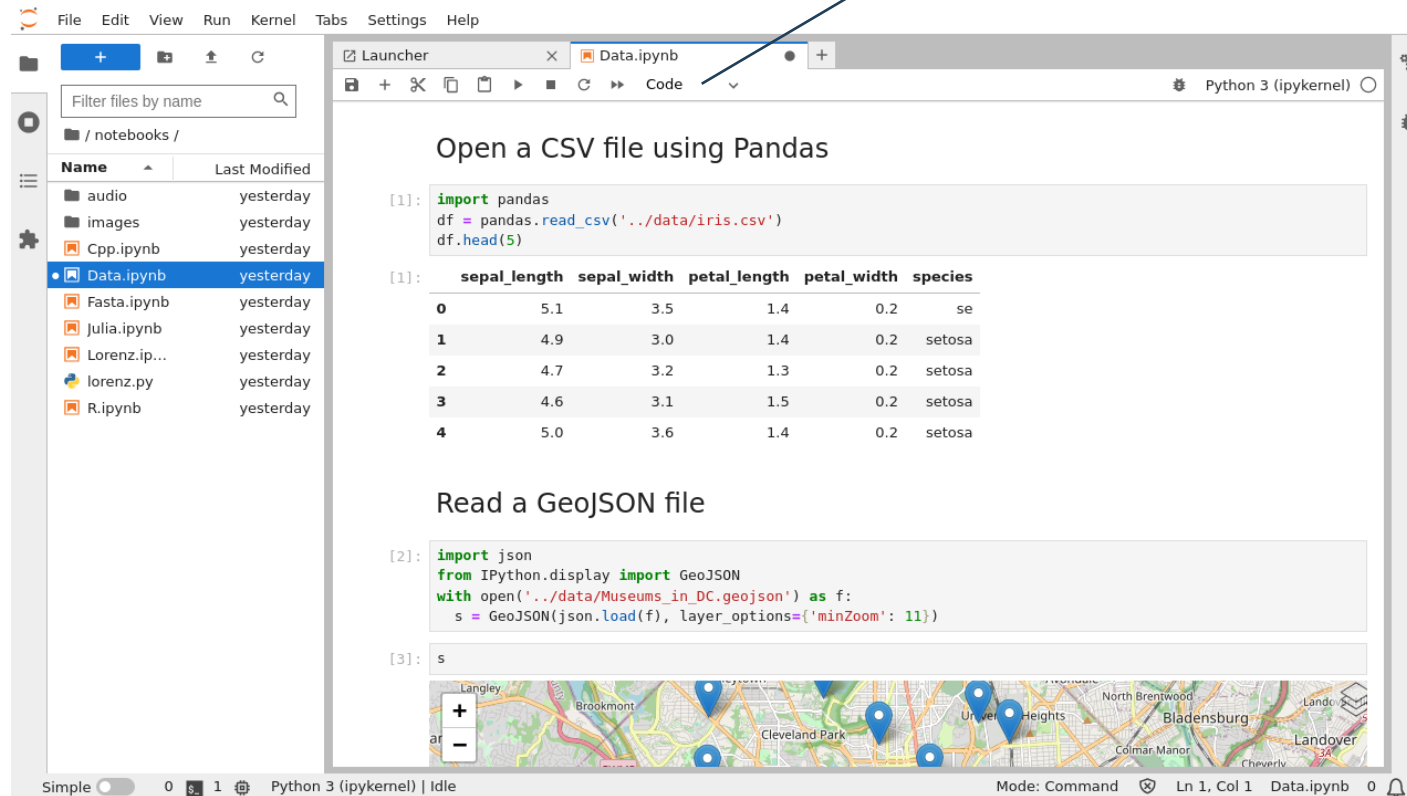
The text editor includes syntax highlighting, configurable indentation (tabs or spaces) and basic theming. These settings can be found in the Settings menu.



[Text Editor — JupyterLab 4.0.5 documentation](#)

Notebooks

You work with cells.
The cell can be Code or Markdown.



Jupyter notebooks are documents stored into .ipynb files. You can convert these documents into several other formats (File > Save and Export Notebook as ...)

[Notebooks — JupyterLab 4.0.5 documentation](#)

- Jupyter notebooks are documents that combine
- live runnable code with
 - narrative text (Markdown), equations (LaTeX),
 - images,
 - interactive visualizations and
 - other rich output

Markdown

Markdown is a simple way to format text that looks great on any device. It does just the essentials, using keyboard symbols you already know.

[TRY OUR 10 MINUTE MARKDOWN TUTORIAL](#)

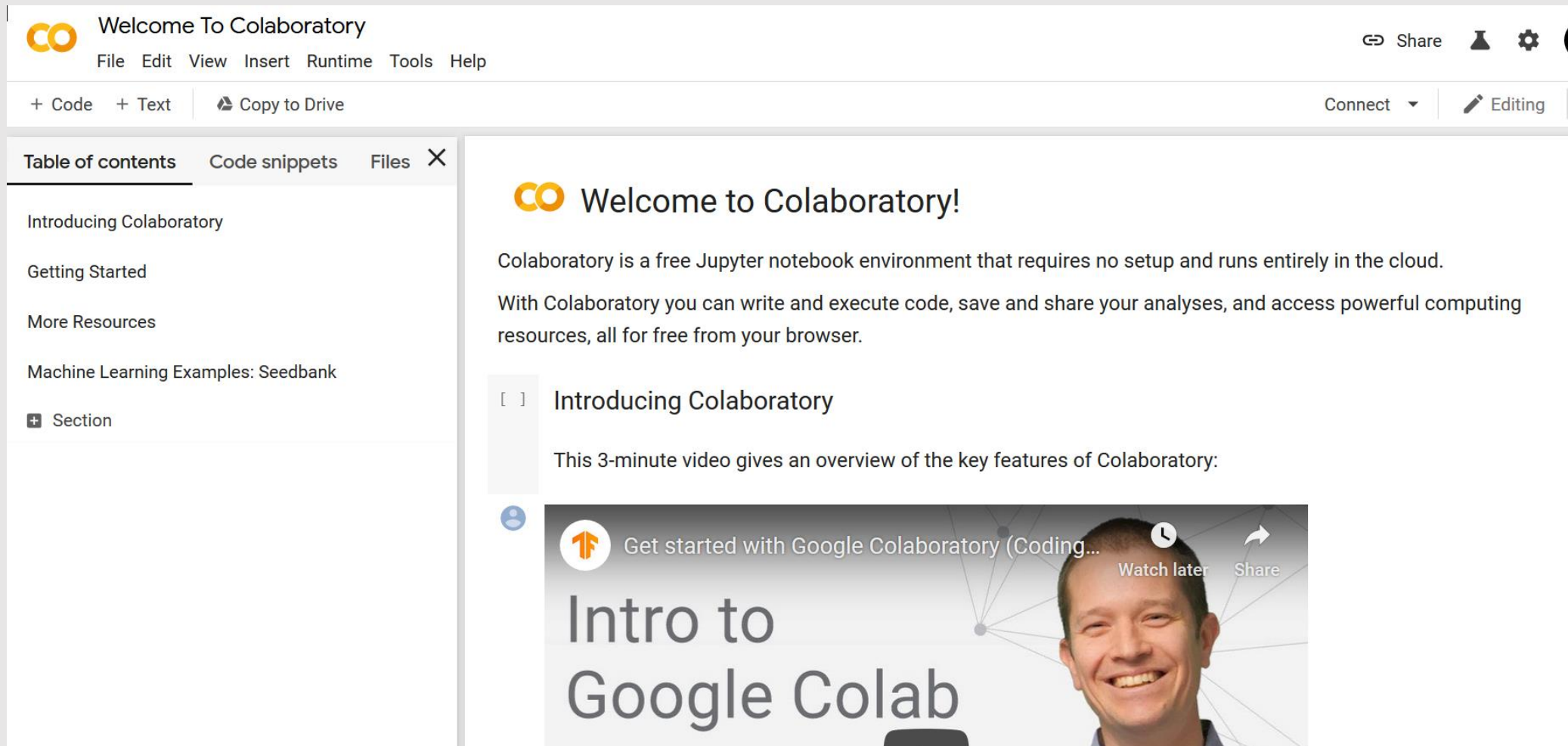
Type	Or	... to Get
<code>*Italic*</code>	<code>_Italic_</code>	<i>Italic</i>
<code>**Bold**</code>	<code>__Bold__</code>	Bold
<code># Heading 1</code>	<code>Heading 1 =====</code>	Heading 1
<code>## Heading 2</code>	<code>Heading 2 -----</code>	Heading 2
<code>[Link](http://a.com)</code>	<code>[Link][1] : [1]: http://b.org</code>	Link
<code>![Image](http://url/a.png)</code>	<code>![Image][1] : [1]: http://url/b.jpg</code>	

Extras

Jupyter Notebook Cloud Services

- [Google Colab](#)
- [CSC Notebooks \(Finland, EU\)](#)
- [Anaconda Nucleus](#)
- [Kaggle: Your Machine Learning and Data Science Community](#)
- [GitHub Codespaces \(Microsoft\)](#)
- [JupyterHub \(Amazon EMR\)](#)

Google Colab and Notebooks



The screenshot shows the Google Colaboratory interface. At the top, there's a header with the Colab logo and the text "Welcome To Colaboratory". Below this is a menu bar with options: File, Edit, View, Insert, Runtime, Tools, and Help. On the right side of the header, there are icons for sharing, a terminal, and settings. Below the header, there's a secondary bar with "+ Code", "+ Text", and "Copy to Drive" on the left, and "Connect" and "Editing" on the right. The main content area is divided into two sections. On the left, there's a sidebar with a "Table of contents" tab, showing links to "Introducing Colaboratory", "Getting Started", "More Resources", and "Machine Learning Examples: Seedbank". The main section on the right has a heading "Welcome to Colaboratory!" followed by a paragraph explaining that Colaboratory is a free Jupyter notebook environment that runs in the cloud. Below this, there's a section titled "Introducing Colaboratory" with a video player. The video player shows a thumbnail with the text "Intro to Google Colab" and a smiling man's face. Above the video, there's a text box that says "This 3-minute video gives an overview of the key features of Colaboratory:". The video player also has controls for "Watch later" and "Share".

CO Welcome To Colaboratory

File Edit View Insert Runtime Tools Help

+ Code + Text Copy to Drive

Connect Editing

Table of contents Code snippets Files X

Introducing Colaboratory

Getting Started

More Resources

Machine Learning Examples: Seedbank

+ Section

CO Welcome to Colaboratory!

Colaboratory is a free Jupyter notebook environment that requires no setup and runs entirely in the cloud.

With Colaboratory you can write and execute code, save and share your analyses, and access powerful computing resources, all for free from your browser.

[] Introducing Colaboratory

This 3-minute video gives an overview of the key features of Colaboratory:


Get started with Google Colaboratory (Coding...)

Watch later Share

Intro to Google Colab

<https://colab.research.google.com/>

CSC Notebooks (in Finland, EU)



Notebooks

[Documentation](#) [Terms & Pricing](#) [Accessibility](#) [Contact us](#)

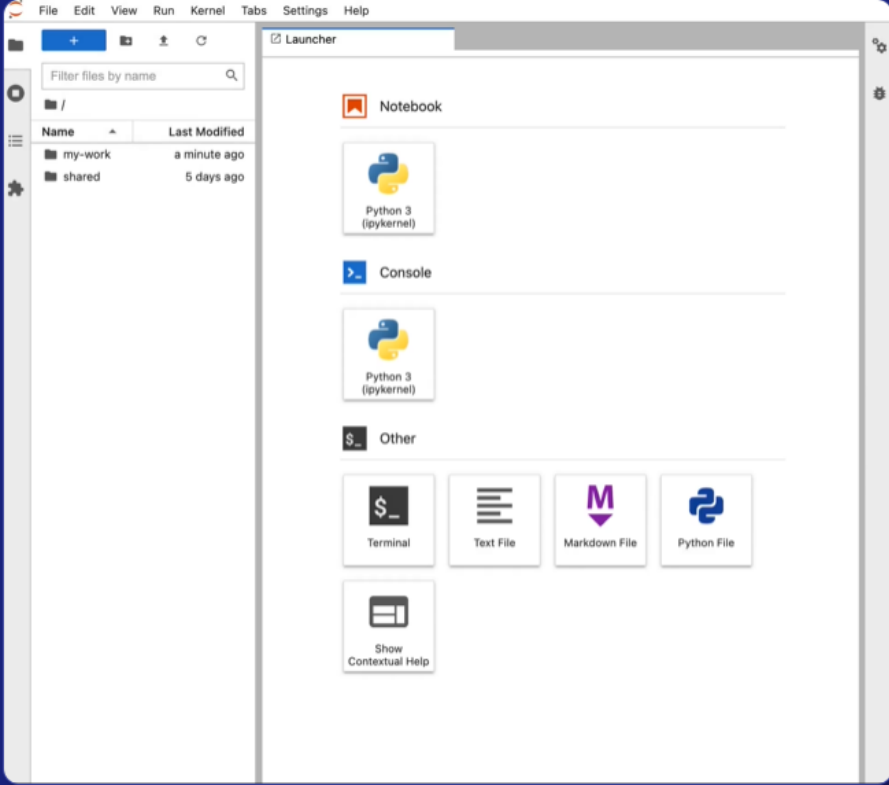
Easy-to-use applications for working with data and programming.

Log in to see the catalogue of available applications. Applications run in CSC cloud and are accessed with your browser.

Notebooks is perfect for hosting courses. If you want to host your own course using CSC Notebooks, please fill out the [course request form](#).

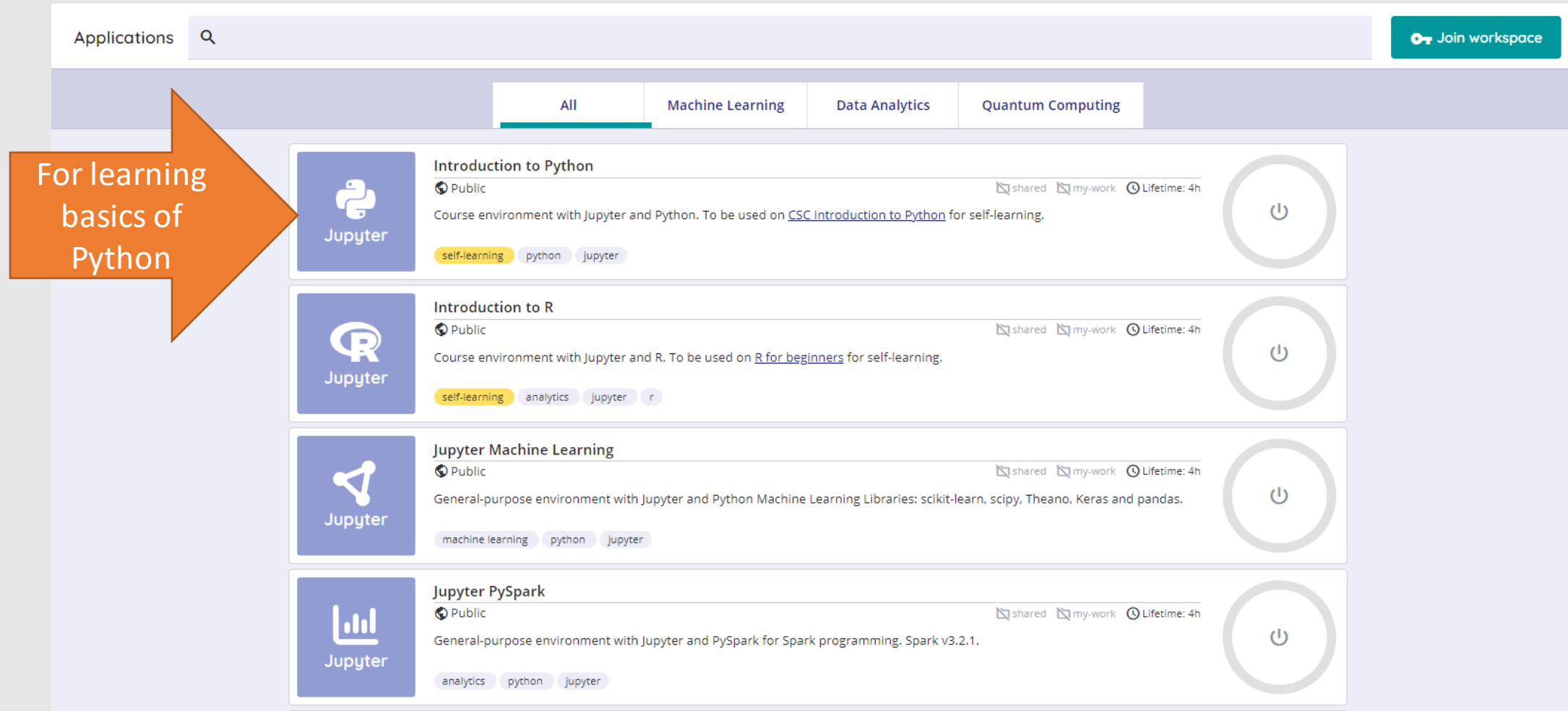
Login
Haka / Virtu / CSC account
[> Special Login](#)

NOTE: Previous version of CSC Notebooks is available at notebooks-old.csc.fi until August 1st 2022



[Notebooks\(rahtiapp.fi\)](https://notebooks.rahtiapp.fi)

CSC Notebooks Environments



The screenshot shows the CSC Notebooks Environments interface. At the top, there is a search bar labeled 'Applications' and a 'Join workspace' button. Below the search bar, there are tabs for 'All', 'Machine Learning', 'Data Analytics', and 'Quantum Computing'. The 'All' tab is selected. The main content area displays four Jupyter environments:

- Introduction to Python**: Course environment with Jupyter and Python. To be used on [CSC Introduction to Python](#) for self-learning. Tags: self-learning, python, jupyter. Lifetime: 4h.
- Introduction to R**: Course environment with Jupyter and R. To be used on [R for beginners](#) for self-learning. Tags: self-learning, analytics, jupyter, r. Lifetime: 4h.
- Jupyter Machine Learning**: General-purpose environment with Jupyter and Python Machine Learning Libraries: scikit-learn, scipy, Theano, Keras and pandas. Tags: machine learning, python, jupyter. Lifetime: 4h.
- Jupyter PySpark**: General-purpose environment with Jupyter and PySpark for Spark programming. Spark v3.2.1. Tags: analytics, python, jupyter. Lifetime: 4h.

An orange arrow points from the text 'For learning basics of Python' to the 'Introduction to Python' environment.

[Notebooks \(rahtiapp.fi\)](https://rahtiapp.fi)

Github and Notebooks (Example)

The screenshot shows the GitHub repository page for `csc-training / python-introduction`. The repository has 0 Watchers, 8 Stars, and 10 Forks. The main navigation bar includes links for Code, Issues (1), Pull requests, Actions, Projects, Security, and Insights. Below the navigation bar, there are buttons for 'gh-pages', '4 branches', and '0 tags', along with 'Go to file' and 'Code' buttons. A commit message is displayed: 'jussienko Merge branch 'gh-pages' of https://github.com/csc-training/python-int... 8212fd6 on Dec 4, 2018 46 commits'. A table lists the repository's files and folders with their commit messages and dates. The README.md file is expanded, showing the title 'Introduction to Python course at CSC' and a description of the repository's content. The right sidebar contains sections for 'About' (Introduction to Python 3, README, MIT License), 'Releases' (No releases published), 'Packages' (No packages published), 'Contributors' (2 contributors: jussienko and Jyrsa), and 'Languages' (Jupyter Notebook 99.7%, Other 0.3%).

File/Folder	Commit Message	Time Ago
assets	add custom js for future download by config	4 years ago
bootstrap	add bootstrap directory	3 years ago
images	Adding a NumPy notebook	4 years ago
notebooks	Merge branch 'gh-pages' of https://github.com/csc-training/python-int...	2 years ago
LICENSE	initial commit	4 years ago
README.md	Update README.md	2 years ago
requirements.txt	First draft of walk-along tutorials and exercises.	4 years ago

README.md

Introduction to Python course at CSC

This repository contains the content for the Introduction to Python course at CSC. Material is provided as Jupyter Notebooks which can be found under the [notebooks](#) folder.

This page has been designed from the get-go to also be a Github Pages page. This is a test of creating a Github Pages page for a CSC course. Feedback is welcome and we don't make any promises to maintain the page.

Running examples locally

About
Introduction to Python 3
Readme
MIT License

Releases
No releases published

Packages
No packages published

Contributors 2
jussienko Jussi Enkovaara
Jyrsa Jyry Suvilehto

Languages
Jupyter Notebook 99.7%
Other 0.3%

[csc-training/python-introduction: Introduction to Python 3 \(github.com\)](https://github.com/csc-training/python-introduction)

Behind the scene

Front End:

- JupyterLab in Browser

Back End:

- your own Laptop as a server, or
- any cloud server like Google Colab, AWS, Azure, CSC Notebooks, ...

Environments

IPython console, IPython notebook, Spyder, ...

Python language

Python 2, Python 3, ...

Python packages

numpy, scipy, matplotlib, ...

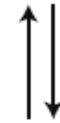
System and system libraries

OS, BLAS, LAPACK, ...

IPython



Python 3



numpy



ATLAS BLAS
(optional)

Figure 1-2. An overview of the components and layers in the scientific computing environment for Python, from a user's perspective, from top to bottom. Users typically only interact with the top three layers, but the bottom layer constitutes a very important part of the software stack. An example of specific software components from each layer in the stack is shown in the right part of the figure